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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/610,237	07/05/2000	Michael N. Grimbergen	2813.D1/SILICO:JB	5355

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APPLIED MATERIALS, INC.
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EXAMINER

LUND, JEFFRIE ROBERT

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 05/06/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/610,237

Applicant(s)

GRIMBERGEN ET AL.

Examiner

Jeffrie R. Lund

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9, 12, 19, 20, 26-32, 34-36, 129 and 130 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 89-128 is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☒ Claim(s) 10, 11, 17, 18, 37 and 38 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 05 July 2000 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-4, 8, 9, 12, 19, 20, 26-28, 32, 35, and 36 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Imatake et al, US Patent 5,759,424.

Imatake et al teaches a processing chamber 2 that includes: a support 22 for supporting a substrate 5; a gas distributor 9; a gas energizer 22 for coupling energy to the process gas; glass window (radiation transmitting portion) 15; and a mask 14 overlying the glass window 15 having an aperture with an aspect ratio of 5:1. The mask extends into the processing chamber, which is defined by the wall 20, the outer edge of the mask 14, and the glass window. (See figures 1, 2, and 4, column 9 lines 1-20, and column 13 line 43 through column 14 line 40.)

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-9, 12, 19, 20, 26-32, 34-36, 129, and 130 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koshimizu, US Patent 5,290,383, in view of Oshida et al.

Koshimizu teaches a reactor with a support 3, a gas distributor 1a, a gas energizer 2, a radiation transmitting portion 11, and an exhaust 1b.

Koshimizu differs from the present claims in that Koshimizu does not teach a mask having an aperture with a specific aspect ratio (i.e. 0.25:1 to 3:1 or 1:1 to 12:1), specific size, and a specific shape.

Oshida et al teaches a mask, having a plurality of apertures with a high aspect ratio, which is used to shield a radiation transmitting portion and reduce access of etching gases to the radiation transmitting portion. (Figure 4, paragraphs 16, 26)

The motivation for using the mask of Oshida et al in the apparatus of Koshimizu is to reduce access of etching gases to the radiation transmitting portion. The aspect ratio, size, and shape are obvious design limitations and it would be obvious to optimize the aspect ratio, size, and shape to minimize the access of the etching gas to the radiation transmitting portion. It was held in *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), by the Federal Circuit that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art

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device, the claimed device was not patentably distinct from the prior art device. (Also see MPEP 2144.04 (d)) It has also been held that a change in shape is a matter of choice, which a person of ordinary skill in the art would have found obvious. (See *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966) MPEP 2144.04(d))

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the mask of Oshida et al in the apparatus of Koshimizu and to optimize the aspect ratio, size, and shape of the aperture.

5. Claims 6, 7, 31 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imatake et al.

Imatake et al was discussed above.

Imatake et al differs from the present invention in that Imatake et al does not teach a mask having an aperture with a specific size (i.e. diameter or width of about 0.1 to 50 mm, and a height of about 0.5 to 500 mm), and a specific shape.

The motivation for changing the size or shape of the aperture is to optimize the size and shape of the aperture as is discussed above.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the size and shape of the aperture of Imatake et al.

Allowable Subject Matter

6. Claims 10, 11, 17, 18, 37, and 38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. Claims 89-128 are allowed.

Response to Arguments

8. Applicant's arguments filed February 8, 2003 have been fully considered but they are not persuasive.

In regard to the argument that Oshida et al teaches that the optic filter described in paragraph 26 is a filter that filters away the milling particles or the process gas species from the optical system and that the filter acts by blocking the milling particles or process gas species, the examiner disagrees. The description found in paragraph 26 is an optical filter designed to filter the light. This optical filter also has the added benefit in that it limits the contamination of the light source. This is a result of the aspect ratio not the diameter of the holes. There is absolutely no teaching in Oshida et al of a physical gas filter i.e. physically blocking the particles. Furthermore, Oshida et al teaches in paragraph 16 that the "opaque perforated filter having a plural holes with an aspect ratio corresponding the directionality of the detection system is set in front of the objective lens or aperture *window* where said contamination of the optical system would take place. In this way, the *etching gas* or the fine particles formed in milling that were formerly the source of contamination can hardly reach said objective lens or *window*... As a result, *contamination of the objective lens and window can be prevented*" (Italics added).

In regard to the argument that Oshida et al does not teach selecting an aspect ratio that is selected to reduce deposition of process residues on the radiation transmitting portion, and has other considerations for optimizing the aspect ratio (i.e. optical properties), the examiner disagrees. Oshida et al clearly teaches that the mask

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apertures have an aspect ratio that limits the deposition of process residues on the radiation transmitting portion (see the last lines of paragraphs 16 and 26). As to any other considerations in making the mask, the claim only requires that the aspect ratio be chosen to reduce deposition of process residues.

In regard to the argument that Imatake et al does not teach a mask overlying the radiation transmitting portion and extending into the interior of the process chamber but teaches a plasma shielding means that is positioned in a recess behind the wall 20 of the processing chamber, the examiner disagrees. The interior of the chamber includes all the space defined by the walls used to enclose the chamber. The chamber of Imatake et al is defined by the chamber wall 20 and includes the recess defined by the exterior edge of the plasma shield 14 and the glass plate 15. Thus the area inside of the recess is part of the interior of the process chamber, and the plasma shield 14 extends into the interior of the recess.

In regard to the argument that Koshimizu et al and Oshida et al do not teach placing a mask on a radiation transmitting portion i.e. a window, the examiner disagrees. Oshida et al clearly teaches that the mask can overlie a window in paragraph 16 as quoted and highlighted above.

In regard to the arguments direct to the specific aspect ration of the mask, as discussed above, the specific aspect ratio of the mask is an obvious design limitation. One of ordinary skill in the art that wanted to make the mask taught by Oshida et al would be require, through simple testing, to determine the optimal aspect ratio of the mask. Furthermore, as discussed above, it was held in *Gardner v. TEC Systems, Inc.*,

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725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), by the Federal Circuit that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. If the mask of Oshida et al were made with the claimed dimensions it would perform in the same manor as the claimed invention. Therefore, the claims are not patentably distinct from the mask of Oshida et al.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hayakawa et al, JP 04-160158, teaches a mask that has an aspect ratio (length to diameter) of $50 \text{ mm}/4 \text{ mm} = 12.5:1$.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrie R. Lund whose telephone number is (703) 308-1796. The examiner can normally be reached on Monday-Thursday (6:30 am-6:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703) 308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

